OIPE
70570
OCT 0 8 2003
PATENT & TRADEMARK OFFICE

US006350111B1

(12) **United States Patent**
Perevozchikov et al.

(10) **Patent No.: US 6,350,111 B1**
(45) **Date of Patent: Feb. 26, 2002**

(54) **SCROLL MACHINE WITH PORTED ORBITING SCROLL MEMBER**

(75) Inventors: **Michael Mikhaylovich Perevozchikov**, Troy; **Roy Doepker**, Lima, both of OH (US)

(73) Assignee: **Copeland Corporation**, Sidney, OH (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/639,004**

(22) Filed: **Aug. 15, 2000**

(51) **Int. Cl.**[7] **F04B 49/03**; F04C 18/04; F04C 29/10

(52) **U.S. Cl.** **417/440**; 418/55.6; 418/87; 418/99

(58) **Field of Search** 417/310, 440; 418/55.6, 84, 87, 99

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,314,796 A	*	2/1982	Terauchi	417/310
4,818,198 A		4/1989	Tamura et al.	418/57
4,898,521 A		2/1990	Sakurai et al.	418/88
5,178,527 A		1/1993	Jung	418/55.6
5,329,788 A	*	7/1994	Caillat et al.	418/99
5,645,408 A		7/1997	Fujio et al.	418/55.6
5,660,539 A		8/1997	Matsunaga et al.	418/55.6
5,722,257 A		3/1998	Ishii et al.	418/97
5,810,573 A		9/1998	Mitsunaga et al.	418/55.6
5,888,057 A		3/1999	Kitano et al.	418/55.6
5,931,650 A		8/1999	Yasu et al.	418/55.6
5,989,000 A		11/1999	Tomayko et al.	418/55.5

FOREIGN PATENT DOCUMENTS

JP	6-26472	*	2/1994	417/440

* cited by examiner

Primary Examiner—John J. Vrablik
(74) *Attorney, Agent, or Firm*—Harness, Dickey & Pierce, P.L.C.

(57) **ABSTRACT**

A scroll compressor includes a fluid injection system. The fluid injection system includes a fluid passage which extends from a position outside of the shell of the compressor to the fluid pockets created by the wraps of the scroll members. The fluid passage extends through the orbiting scroll member. The fluid injection system can be used to inject gaseous or liquid refrigerant, lubricant or the fluid injection system can be used to vent the moving pocket to the suction area of the compressor for capacity modulation.

25 Claims, 4 Drawing Sheets